INDEX

A^+ [*now called* Ξ_c^+] **23,** 245
$A(1680)$ or A_3 [*now called* $\pi_2(1670)$] **30,** 299
$A(2100)$ [*now called* $\pi_2(2100)$] 312
$a_0(980)$ [*was* $\delta(980)$] **29,** 278
$a_1(1260)$ [*was* $A(1270)$ or A_1] **29,** 283
$a_2(1320)$ [*was* $A_2(1320)$] **30,** 289
$a_3(2050)$ [*was* $A(2050)$] 311
A_3 [*now called* $\pi_2(1670)$] **30,** 299
$a_4(2040)$ [*was* $\delta(2040)$] 310
$a_6(2450)$ [*was* $\delta(2450)$] 317
Abbreviations used in Full Listings 130
Accelerator parameters (colliders) 58
Acceptance-rejection method in Monte Carlo 82
Activity, unit of, for radioactivity 73
Algorithms for Monte Carlo 83
α_s, QCD coupling constant 96
Amu (atomic mass unit), value of 51
Argand diagram, definition 93
Argand diagrams for Λ and Σ resonances 420
Argand diagrams for N and Δ resonances 368
Argon, dE/dx resolution 62
Astronomical unit, value of 52
Astrophysics 52
Atmosphere, value of 51
Atomic and nuclear properties of materials 54
Atomic mass unit, value of 51
Attenuation length for photons 70
Attenuation, photon and electron 70
Authors and consultants for this Review 4
Averaging data, relations for 77
Averaging of particle properties data in this Review 8
Avogadro number, value of 51
Axion searches **25,** 251
Axion searches, note on 251
B (bottom meson) **20,** 215, 220
b quark lifetime and K-M matrix 108
$B^\pm$ **20,** 216
B^0, $\overline{B}^0$ **20,** 217
B^* 222
$b_1(1235)$ [*was* $B(1235)$] **29,** 282
Baryon conservation, tests of (see also p mean life, $n-\overline{n}$ oscillations) 48
Baryon decay parameters, note on 227
Baryon magnetic moments, note on 230
Baryon resonances **38,** 366
  Cascade resonances (Ξ resonances) **43,** 463
  Charmed baryons 471
  Contents of Baryon Full Listings (status table) **38**
  Dibaryons 472
  Exotic resonances (Z resonances) 417
  Hyperon resonances (Λ resonances) **41,** 417, 431
  Hyperon resonances (Σ resonances) **42,** 417, 443
  Nucleon resonances (Δ resonances) **40,** 366, 400
  Nucleon resonances (N resonances) **38,** 366, 380
  Omega resonances (Ω resonances) **43,** 470
Baryon resonances, SU(3) classification of 111
Baryonium candidates 317
Baryon number conservation 48
Baryons in quark model 111
Baryons, definition used in this Review 3
Baryons, stable **21,** 222
  (see individual entries for p, n, Λ, Σ, Ξ, Ω, Λ_c, Ξ_c, Ω_c, and Λ_b)
$B\overline{B}$ mixing 108
Beam momentum, c.m. energy and momentum vs. 89
Beauty -- see Bottom
BEBC (China) accelerator parameters 59
Becquerel, unit of radioactivity 73
Bethe-Bloch equation 64
Bias, definition of 77
Big bang cosmology 52
Binomial distribution, Monte Carlo algorithm for 83
Binomial distribution, relations for 74
Biological damage from radiation 73
BITNET address for comments on this Review 4
Bivariate Gaussian 75
Bohr magneton, value of 51
Bohr radius, value of 51
Boltzmann constant, value of 51
Bosons **13, 25,** 134, 135, 251, 257
Bottom baryon (Λ_b) 245
Bottom-changing neutral currents, tests for 45
Bottom mesons (B, B^*) **20,** 215
Bottom mesons, note on highlights 215
Bottomonium system, level diagram 338
Bounded physical region, statistical limits in the presence of 80
Breit-Wigner probability density function 76
Breit-Wigner resonance, definition 93
C (charge conjugation), tests of conservation 45
Cabibbo and Kobayashi-Maskawa mixing 107
Cabibbo angle 107
Capacitance, formulas for 85
Cascade resonances (Ξ resonances) **43,** 463
Centauro searches 266
Central limit theorem 75
Cerenkov radiation 61
Change of random variables, relations for 74
Charge conjugation of $q\overline{q}$ states 109
Charge conservation 45
Charge, electron, value of 51, 84
Chargino searches **26,** 260
Charm-changing neutral currents, tests for 45
Charmed, nonstrange baryons (Λ_c, Σ_c) **23, 43,** 243, 471
Charmed, nonstrange mesons (D,D^*,D_J) **18, 36,** 201, 361
Charmed, strange baryons (Ξ_c^+, Ω_c^0) **23,** 245
Charmed, strange mesons [D_s,D_s^*] **19,** 212
Charmonium system, level diagram 321
χ^2 confidence level vs. χ^2 for n_d degrees of freedom 76
χ^2 distribution, Monte Carlo algorithm for 83
χ^2 distribution, relations for 75
$\chi_{b0}(1P)$ or $\chi_{b0}(9860)$ **34,** 340
$\chi_{b0}(2P)$ or $\chi_{b0}(10235)$ **34,** 343
$\chi_{b1}(1P)$ or $\chi_{b1}(9890)$ **34,** 341
$\chi_{b1}(2P)$ or $\chi_{b1}(10255)$ **34,** 343
$\chi_{b2}(1P)$ or $\chi_{b2}(9915)$ **34,** 341
$\chi_{b2}(2P)$ or $\chi_{b2}(10270)$ **34,** 343
$\chi_{c0}(1P)$ or $\chi_{c0}(3415)$ **33,** 329
$\chi_{c1}(1P)$ or $\chi_{c1}(3510)$ **33,** 330
$\chi_{c2}(1P)$ or $\chi_{c2}(3555)$ **33,** 331
Clebsch-Gordan coefficients 86
C.M. energy and momentum vs. beam momentum 89
Collider parameters 58
Compensating calorimeters 62
Compilations, particle physics 477

Greek letters are alphabetized by their English-language spelling. Bold page numbers signify entries in Particle Properties Summary Tables.
† Omitted from this edition; see listed page number in Phys. Lett. **111B** (1982).

Compositeness, quark and lepton, searches **26,** 263
Compositeness, quark and lepton, searches, note on 263
Compton scattering for N and Δ resonances, photoproduction and (review) 377
Conditional probability density function 74
Confidence interval, definition of 77, 79
Confidence intervals, normal distribution 80
Confidence intervals using Student's t 80
Confidence level, definition 78
Conservation laws 45
Constrained fits, procedures for in this Review 9
Consultants for this Review 4
Conversion probability for photons to e^+e^- 71
Correlation coefficient, definition 74
Cosmic ray background in counters 73
Cosmic ray fluxes 61
Cosmological constant, value of 52
Cosmology 52
Coupling constant in QCD 96
Couplings for photon, W, Z 102
Coulomb scattering through small angles, multiple 65
Covariance, definition 74
CP, tests of conservation 45
CP violation and K-M matrix 107
CP violation in $K_S^0 \to 3\pi$ decays, note on 188
CP-violation parameters in K_L^0 decays, note on 195
CPT, tests of conservation 45
Criteria for new states 8
Cross sections and related quantities, plots of 115
e^+e^-, νN, $\overline{\nu}N$, Λp, γp, γd, $\pi^\pm p$, $\pi^\pm d$, $K^\pm p$, $K^\pm n$, $K^\pm d$, pp, np, pd, $\overline{p}p$, $\overline{p}n$, and $\overline{p}d$ cross sections 120
Fragmentation functions 118
Jet production 118
Multiplicity distributions 117
Nucleon structure functions 115, 116
Pseudorapidity distributions 118
Cross sections, hadronic, high-energy parametrizations 121
Cross sections, relations for 91, 93
Cumulative distribution function, definition 74
Curie, unit of radioactivity 73
d functions 86
$D^\pm$ **18,** 201
$D^\pm$, D^0 branching fractions, note on 202
D^0, $\overline{D}^0$ **19,** 206
$D_J(2420)^0$ **36,** 363
$D(1285)$ [*now called* $f_1(1285)$] **30,** 287
$D(1530)$ [*now called* $f_1(1530)$] **30,** 298
$D^*(2010)^\pm$ **36,** 361
$D^*(2010)^0$ **36,** 362
$D_s^\pm$ [*was* $F^\pm$] **19,** 212
$D_s^\pm$, note on 212
$D_s^{*\pm}$ [*was* $F^{*\pm}$] **19,** 214
Dalitz plot, relations for 91
Damage, biological, from radiation 73
Data, particle properties, averaging and fitting procedures 8
Data, particle properties, selection and treatment 7
Databases, particle physics 478
Decay amplitudes (for hyperon decays) ..... 286†
Decay constants of pseudoscalar mesons, note on 165
Decays, kinematics and phase space for 90
Deep inelastic scattering 93, 97
Definitions for abbreviations used in Full Listings 130
δ, K-M angle for CP violation 107
Δ resonances (see also N and Δ resonances) **40,** 366, 400
$\delta(980)$ [*now called* $a_0(980)$] **29,** 278
$\delta(2040)$ [*now called* $a_4(2040)$] 310
$\delta(2450)$ [*now called* $a_6(2450)$] 317
$\Delta B = 2$, tests for 45
$\Delta C = 2$, tests for 45
$\Delta I = 1/2$ rule for hyperon decays, test of ..... 286†
$\Delta S = 2$, tests for 45
$\Delta S = \Delta Q$ rule in K^0 decay, note on 198
$\Delta S = \Delta Q$, tests of 45
Density effect upon energy loss rate 64
Density of materials, table 54
Detector parameters 61
Deuteron mass, value of 51
Dibaryons 472
Dielectric constant of gaseous elements, table 55
Distributions, probability, definition 74
Dose, radioactivity, unit of absorbed 73
Drift and proportional chamber potentials 63
e (natural log base), value of 51
e (electron) **14, 24,** 151
e^+e^- annihilation, cross-section formulae 94
e^+e^- average multiplicity, plot of 117
$e^+e^-(1100–2200)$ 317
e^+e^- R function, plot of 119
e^+e^- two-photon process, cross-section formula 95
e-d asymmetry 103
$E(1420)$ [*now called* $f_1(1420)$] **30,** 293
Efficiency of statistical estimator, definition 77
Electrical resistivity of elements, table 55
Electromagnetic relations 84
Electromagnetic shower detectors, energy resolution 62
Electromagnetic showers, longitudinal distribution 66
Electron **14, 24,** 151
Electron charge magnitude 51
Electron charge, value of 51, 84
Electron Compton wavelength, value of 51
Electron cyclotron frequency/field, value of 51
Electron mass, value of **14,** 51
Electron practical range 67
Electron radius, classical, value of 51
Electron volt, value of 51
Electronic structure of the elements 57
Electroweak interactions, Standard Model of 102
Electroproduction of N and Δ resonances (review) 379
Electroproduction structure functions, relations for 94
Elements, electronic structure of 57
Elements, periodic table of 56
EMC effect, plot of 117
Energy and momentum (c.m.) vs. beam momentum 89
Energy loss (fractional) for electrons and positrons in lead 72
Energy loss and range in liquid hydrogen 69
Energy loss and range in Pb, Cu, Al, and C 68
Energy loss rates for charged particles 64, 68, 69
Energy loss rates for heavy charged projectiles 64, 68, 69
Energy loss rate for muons at high energies 65
$\epsilon(1300)$ [*now called* $f_0(1400)$] **30,** 292
$\epsilon(2150)$ [*now called* $f_2(2150)$] 313
$\epsilon(2300)$ [*now called* $f_4(2300)$] 315
ϵ_0 (permittivity of free space), value of 51, 84
Equivalent photon approximation 95
Error ellipse for multivariate Gaussian 80
Error estimates in least-squares fitting 78
Error estimates in likelihood fitting 79
Error procedure for masses and widths of meson resonances 346

Greek letters are alphabetized by their English-language spelling. Bold page numbers signify entries in Particle Properties Summary Tables.
† Omitted from this edition; see listed page number in Phys. Lett. **111B** (1982).

Error propagation, relations for 82
Errors, treament of, in this Review 8
Established nonets for the mesons 110
Estimator, definition of 77
η meson **15, 24,** 170
  $\eta \to \gamma\gamma$, note on 170
  η decay parameters, note on 173
$\eta(1280)$ [*was* $\eta(1275)$] **30,** 287
$\eta(1430)$ [*was* $\iota(1440)$] **30,** 294
$\eta(1700)$ [*now called* $X(1700)$] 307
$\eta'(958)$ **28,** 274
$\eta_c(1S)$ or $\eta_c(2980)$ **31,** 321
$\eta_c(2S)$ or $\eta_c(3590)$ 333
Excited lepton searches **26,** 265
Expectation value, definition 74
Expectation value, relations for 74
Exotic baryons (Z^* resonances) 417
Exotic meson resonances 363
Exponential probability density function 77
Exposure, radioactivity, unit of 73
$F^{\pm}$ [*now called* $D_s^{\pm}$] **19,** 212
$F^{*\pm}$ [*now called* $D_s^{*\pm}$] **19,** 214
$f_0(975)$ [*was* $S(975)$ or S^*] **29,** 277
$f_0(1240)$ [*was* $g_S(1240)$] 283
$f_0(1400)$ [*was* $\epsilon(1300)$] **30,** 292
$f_0(1525)$ 296
$f_0(1590)$ **30,** 298
$f_0(1750)$ [*was* $S(1730)$] 308
$f_1(1285)$ [*was* $D(1285)$] **30,** 287
$f_1(1420)$ [*was* $E(1420)$] **30,** 293
$f_1(1530)$ [*was* $D(1530)$] **30,** 298
F_1, F_2, F_3 structure functions 94, 97
$f_2(1270)$ [*was* $f(1270)$] **29,** 284
$f_2(1430)$ 295
$f_2(1720)$ [*was* $\theta(1690)$] **31,** 307
$f_2(1810)$ [*was* $f(1810)$] 309
$f_2(2150)$ [*was* $\epsilon(2150)$] 313
$f_2(2010)$ [*was* $g_T(2010)$] **31,** 310
$f_2(2300)$ [*was* $g_T'(2300)$] **31,** 315
$f_2(2340)$ [*was* $g_T''(2340)$] **31,** 316
$f_2'(1525)$ [*was* $f'(1525)$] **30,** 296
$f_4(2050)$ [*was* $h(2030)$] **31,** 311
$f_4(2300)$ [*was* $\epsilon(2300)$] 315
$f_6(2510)$ [*was* $r(2510)$] 317
Familion searches 254
Fermi coupling constant, value of 51
Feynman's x variable 92
Field equations, electromagnetic 84
Fine structure constant, value of 51
Fits to particle properties data in this Review 9
Fitting data, relations for 78
Flavor-changing neutral currents, tests for 45
Forbidden states in quark model 109
Force, Lorentz 84
Form factors, $\pi \to \ell\nu\gamma$ and $K \to \ell\nu\gamma$, note on 167
Four-fermion interactions 102
Fourth generation, top and, hadron searches **25,** 246
Fractional energy loss for electrons and positrons in lead 72
Fragmentation functions, plot of 118
Fragmentation functions, relations for 95
Free quark searches **25,** 247
Friedmann equation 52
Full Listings, description of 3
Full Listings, keys to reading 129
Fundamental fermions 102
$g(1690)$ [*now called* $\rho_3(1690)$] **31,** 301
$g_S(1240)$ [*now called* $f_0(1240)$] 283
$g_T(2010)$ [*now called* $f_2(2010)$] **31,** 310
$g_T'(2300)$ [*now called* $f_2(2300)$] **31,** 315
$g_T''(2340)$ [*now called* $f_2(2340)$] **31,** 316
γ (Euler's constant), value of 51
γ (photon) **13,** 134
γp and γd cross sections, plots of 122
Gamma distribution, Monte Carlo algorithm for 83
Gamma distribution, relations for 77
Gauge bosons **13,** 134
  (see individual entries for γ, W, and Z)
Gauge couplings 102
Gauss-Markov theorem, definition 77
Gaussian distribution, Monte Carlo algorithm for 83
Gaussian distribution, multivariate 75
Gaussian distribution, relations for 75
Gaussian distribution, upper limits 80
Gell-Mann/Okubo formula 109
Gluino searches **26,** 261
Gluonium candidates 365
Gravitational acceleration, standard value of 51
Gravitational constant, value of 51
Gray, unit of absorbed dose of radiation 73
$h(2030)$ [*now called* $f_4(2050)$] **31,** 311
$h_1(1170)$ [*was* $H(1190)$] **29,** 281
$h_1(1380)$ 292
Hadronic cross-sections, high-energy parametrizations 121
Hadronic flavor conservation 45
Hadronic shower detectors 62
Half-lives of commonly used radioactive nuclides 73
Heavy boson searches 257
Heavy lepton searches **25, 26,** 148
Heavy particle searches 267
HEPNET address for comments on this Review 4
HERA (DESY) accelerator parameters 60
Higgs searches **25,** 255
Higgs searches, note on 255
History of particle properties measurements, discussion 11
Hubble parameter, value of 52
Hyperon decays, nonleptonic decay amplitudes ..... 286†
Hyperon decays, test of $\Delta I = 1/2$ rule for ..... 286†
Hyperon resonances (see Λ and Σ resonances) **41,** 417
ID particle codes for Monte Carlos 113
Ideal mixing in quark model 110
Ideograms, criteria for presentation 9
Illustrative key to the Full Listings 129
Impedance, relations for 85
Inclusive distributions, one-particle, relations for 95
Inclusive hadronic reactions 95
Inclusive reactions, kinematics for 92
Inconsistent particle properties data, treatment of in this Review 9
Independence of random variables 74
Inductance, relations for 85
International System (SI) units 53
Introduction to this Review 3
Ionization energy loss at minimum, table 54
Ionization yields for heavy charged projectiles 64
$\iota(1440)$ [*now called* $\eta(1430)$] **30,** 294
Inverse transform method in Monte Carlo 82
Jet production in pp and $\bar{p}p$ interactions, plot of 118
$J/\psi(1S)$ [or $J/\psi(3097)$] **32,** 323

Greek letters are alphabetized by their English-language spelling. Bold page numbers signify entries in Particle Properties Summary Tables.
† Omitted from this edition; see listed page number in Phys. Lett. **111B** (1982).

$K \to 3\pi$ Dalitz plot parameters, note on 181
$K \to \ell\nu\gamma$ form factors, note on 167
$K^{\pm}$ **16, 24,** 175
K^+p, K^+n, and K^+d cross sections, plots of 124
K^-p, K^-n, and K^-d cross sections, plots of 125
K^0, $\overline{K}^0$ **17, 24,** 186
K^0 decay, note on $\Delta S = \Delta Q$ rule in 198
K_L^0 ..... **17, 24,** 189
K_L^0 decays, note on CP-violation parameters in 195
K_S^0 ..... **17,** 187
$K_S^0 \to 3\pi$ decay, note on CP violation in 188
$K(1460)$ [*was* $K(1400)$] 355
$K(1830)$ 359
$K^*(892)$ **35,** 346
$K^*(1415)$ [*was* $K^*(1410)$] **35,** 351
$K^*(1715)$ [*was* $K^*(1790)$] **35,** 356
$K_0^*(1350)$ [*now called* $K_0^*(1430)$] **35,** 352
$K_0^*(1430)$ [*was* $K_0^*(1350)$, *was* $\kappa(1350)$] **35,** 352
$K_1(1270)$ [*was* $Q(1280)$ or Q_1] **35,** 349
$K_1(1400)$ [*was* $Q(1400)$ or Q_2] **35,** 350
$K_1(1650)$ 356
$K_2(1580)$ [*was* $L(1580)$] 355
$K_2(1770)$ [*was* $L(1770)$] **35,** 357
$K_2(2250)$ [*was* $K(2250)$] 360
$K_2^*(1430)$ [*was* $K^*(1430)$] **35,** 352
$K_2^*(1960)$ 359
$K_3(2320)$ [*was* $K(2320)$] 360
$K_3^*(1780)$ [*was* $K^*(1780)$] **35,** 358
$K_4(2500)$ [*was* $K(2500)$] 361
$K_4^*(2075)$ [*was* $K^*(2060)$] **35,** 359
$K_5^*(2380)$ 361
$K_{\ell 3}$ form factors, note on 182
Kaon (see K) **16, 24,** 175
$\kappa(1350)$ [*now called* $K_0^*(1430)$] **35,** 352
Key to the Full Listings 129
Kinematics, decays, and scattering 90
Knock-on electrons, energetic 64
Kobayashi-Maskawa mixing matrix 107
$L(1580)$ [*now called* $K_2(1580)$] 355
$L(1770)$ [*now called* $K_2(1770)$] **35,** 357
Lagrangian, standard electroweak 102
Λ **22,** 229
Λp cross section, plot of 122
Λ and Σ resonances **41,** 417
Argand diagrams 420
Listings, Λ resonances 431
Listings, Σ resonances 443
Formation experiments (review) 417
Production experiments (review) 431
Status of (review) 417
Λ, QCD parameter 96
Λ_b 245
Λ_c^+ **23,** 243
Least-squares fitting, bins with few events 78
Least-squares fitting, linear 77
Lee-Sugawara relation ..... 287†
LEP (CERN) accelerator parameters 59
Lethal dose from penetrating ionizing radiation 73
Lepton conservation, tests of 45
Lepton (heavy) searches **25,** 148
Lepton mixing, neutrinos (massive) and, search for 140
Lepton, quark compositeness searches **26,** 263
Lepton, quark substructure searches **26,** 263
Leptons **13,** 136
(see individual entries for ν_e, e, ν_μ, μ, ν_τ, and τ)
Leptons, weak interactions of quarks and 102
Leptoproduction cross sections, relations for 93
Leptoproduction kinematics 93
Leptoquark searches 259
LHC (CERN) accelerator parameters 60
Light boson searches 251
Light neutrino types, number of **25,** 145
Light particle searches 266
Light, speed of 51
Light year, length of 52
Likelihood condition 79
Likelihood function 79
Limits (statistical) in the presence of a bounded physical region . 80
Linear least-squares fitting 77
Liquid ionization chambers, free electron drift 62
Listings, Full, keys to reading 129
Lorentz force 84
Lorentz invariant amplitudes 90
Lorentz transformations of four-vectors 90
Magnetic monopole searches **25,** 249
Magnetic moments, baryon, note on 230
Majoron searches 254
Mandelstam variables 91
Marginal probability density function 74
Mass attenuation coefficient for photons, defined 70
Massive neutrinos and lepton mixing, search for **25,** 140
Materials, atomic and nuclear properties of 54
Matter, passage of particles through 64
Maximum likelihood 79
Maxwell equations 84
Mean range and energy loss in liquid hydrogen 69
Mean range and energy loss in Pb, Cu, Al, and C 68
Median, definition 74
Median, variance of 74
Meson multiplets in quark model 110
Meson nonets (established) 110
Meson resonances **28,** 269
Bottom meson resonances 363
Charmed, nonstrange meson resonances **36,** 361
Exotic meson resonances 363
Nonstrange meson resonances **28,** 269
Strange meson resonances **35,** 346
Table of Contents of Meson Full Listings **37**
Mesons, definition used in this Review 3
Mesons, stable **15,** 165
(see individual entries for π, η, K, D, D_s, and B)
Metric prefixes, commonly used 53
Minimal subtraction scheme in QCD 96
Mixing angle, weak 102
Mixing, quark model, ideal 110
Mixing, singlet-octet in quark model 110
Modernization of this Review, description 3
Molar volume, value of 51
Momenta, measurement of, in a magnetic field 62
Momentum — c.m. energy and momentum
vs. beam momentum 89
Momentum transfer, minimum and maximum 92
Monte Carlo 82
Monte Carlo particle numbering scheme 113
Monopole searches **25,** 249
μ **14, 24,** 152
$\mu \to e$ conversion 153

Greek letters are alphabetized by their English-language spelling. Bold page numbers signify entries in Particle Properties Summary Tables.
† Omitted from this edition; see listed page number in Phys. Lett. **111B** (1982).

μ_0 (permeability of free space), value of 51, 84
Multibody decay kinematics 91
Multiple Coulomb scattering through small angles 65
Multiplets, meson in quark model 110
Multiplets, SU(n) 88
Multiplicity, average in e^+e^- interactions, plot of 117
Multiplicity, average in pp and $\overline{p}p$ interactions, plot of 117
Multivariate Gaussian 75
Muon **14, 24,** 152
Muon decay parameters, note on 154
Muon energy loss rate at high energies 65
Muon lifetime formula 102
M_W 102
M_Z 102
n (neutron) **21, 24,** 226
N and Δ resonances **38,** 366
  Argand diagrams 368
  Listings, Δ resonances 400
  Listings, N resonances 380
  Electroproduction (review) 379
  Photoproduction and Compton scattering (review) 377
  $\pi N \rightarrow N\pi\pi$ channel (review) 376
  Pole parameters 375
  Production experiments (review) 379
  Status of (review) 366
  Two-body partial-wave analyses (review) 367
N^* resonances (see N and Δ resonances) **38,** 366
$\overline{N}N(1100\text{–}3600)$ 317
n-body differential cross sections 91
n-body phase space 90
$n-\overline{n}$ oscillations 227
Names, particle 5
Neutral-current parameters, standard model expressions for 103
Neutral-current parameters, values for 103
Neutralino searches **26,** 259
Neutrino (see ν) **13,** 136
Neutrino bounds from astrophysics and cosmology 146
Neutrino oscillation searches **25,** 140
Neutrino production structure functions, relations for 94
Neutrino, solar, experiments 142
Neutrino types, number of **25,** 147
Neutrinoless double beta decay, search for 144
Neutrinos (massive) and lepton mixing, search for **25,** 140
Neutrinos, note on 136
Neutron (see n) **21, 24,** 226
Nomenclature for particles 5
Nonets, meson (established) 110
Non-$q\overline{q}$ candidates 363
Normal distribution, confidence intervals for 80
Normal distribution, relations for 75
Normal equation in least-squares fitting 78
ν_e **13,** 138
ν_μ **13,** 139
ν_τ **13,** 140
νN and $\overline{\nu}N$ cross sections, plot of 120
Nuclear collision length, table 54
Nuclear inelastic cross section, table 54
Nuclear interaction length, table 54
Nuclear magneton, value of 51
Nuclear total cross section, table 54
Nucleon resonances (see N and Δ resonances) **38,** 366
Nucleon structure functions, plots of 115, 116
Nuclides, radioactive, commonly used 73
Numbering scheme for particles in Monte Carlos 113
Occupational radiation dose, U.S. maximum permissible 73
Octet-singlet mixing in quark model 110
Omega resonances (Ω resonances) **43,** 470
Ω^- **23, 24,** 241
Ω_c^0 [*was* T^0] 245
$\omega(783)$ **28,** 272
$\omega_3(1670)$ [*was* $\omega(1670)$] **30,** 299
One-particle inclusive distributions, relations for 95
Optical theorem 92
P (parity), tests of conservation 45
p (proton) **21, 24,** 222
p mean life, note on 222
pp average multiplicity, plot of 117
pp jet production 118
pp, np, and pd cross sections, plots of 126
$\overline{p}p$ jet production 118
$\overline{p}p$ pseudorapidity 118
$\overline{p}p$ average multiplicity, plot of 117
$\overline{p}p$, $\overline{p}n$, and $\overline{p}d$ cross sections, plots of 127
Parity of $q\overline{q}$ states 109
Parsec, length of 52
Partial-wave analyses for Λ and Σ resonances (review) 418
Partial-wave analyses for N and Δ resonances (review) 367
Partial-wave diagrams for Λ and Σ resonances 420
Partial-wave diagrams for N and Δ resonances 368
Partial-wave expansion of scattering amplitude 92
Particle detectors 61
Particle ID numbers for Monte Carlos 113
Particle nomenclature 5
Passage of particles through matter 64
Periodic table of the elements 56
Permeability μ_0 of free space, value of 51, 84
Permittivity ϵ_0 of free space, value of 51, 84
Phase space, Lorentz invariant 90
Phase space, relations for 90
$\phi(1020)$ **29,** 279
$\phi(1680)$ **31,** 301
$\phi_J(1850)$ [*now called* $X(1850)$] 310
Photino searches **26,** 259
Photon (see γ) **13,** 134
Photon and electron attenuation 70
Photon attenuation length 70
Photon attenuation length (high energy) 70
Photon collection efficiency, scintillators 61
Photon coupling 102
Photon cross section in carbon and lead, contributions to 72
Photon pair-production cross section, relation to rad. length 67
Photon to e^+e^- conversion probability 71
Photoproduction and Compton scattering for N and Δ resonances (review) 377
Physical constants, table of 51
π, value of 51
$\pi^\pm$ **15,** 165
π^+p and π^+d cross sections, plots of 123
π^-p and π^-d cross sections, plots of 123
π^0 ..... **15,** 168
$\pi(1300)$ **30,** 289
$\pi(1770)$ 309
$\pi_2(1670)$ [*was* $A(1680)$ or A_3] **30,** 299
$\pi_2(2100)$ [*was* $A(2100)$] 312
$\pi \rightarrow \ell\nu\gamma$ form factors, note on 167
$\pi N \rightarrow N\pi\pi$ channel (review) 376
Pion **15,** 165
Planck constant, value of 51

Greek letters are alphabetized by their English-language spelling. Bold page numbers signify entries in Particle Properties Summary Tables.
† Omitted from this edition; see listed page number in Phys. Lett. **111B** (1982).

Planck mass, value of 52
Poisson distribution, Monte Carlo algorithm for 83
Poisson distribution, relations for 75
Poisson distribution, upper limits for 81
Poisson processes with background, upper limits for 81
Polarized-electron deuteron scattering 103
Potentials, electromagnetic 84
Prefixes, metric, commonly used 53
Probability and statistics 74
  χ^2 confidence level vs. χ^2 for n_d degrees of freedom 76
Probability density function, definition 74
Propagation of errors 82
Properties (atomic and nuclear) of materials 54
Proportional and drift chamber potentials 63
Proportional chamber wire instability 63
Proton (see p) **21, 24,** 222
Proton cyclotron frequency/field, value of 51
Proton mass, value of **21,** 51
Pseudorapidity η, defined 92
Pseudorapidity distribution in $\bar{p}p$ interactions, plot of 118
Pseudoscalar mesons, decay constants of, note on 165
$\psi(1S)$ or $\psi(3097)$ or $J/\psi(1S)$ **32,** 323
$\psi(2S)$ or $\psi(3685)$ **33,** 333
$\psi(3770)$ **33,** 336
$\psi(4040)$ **34,** 336
$\psi(4160)$ **34,** 337
$\psi(4415)$ **34,** 337
$Q(1280)$ or Q_1 [*now called* $K_1(1270)$] **35,** 349
$Q(1400)$ or Q_2 [*now called* $K_1(1400)$] **35,** 350
QCD 96
QCD parton model 94
Quality factor for biological damage due to radiation 73
Quantum numbers in quark model 109
Quark and lepton compositeness searches **26,** 266
Quark and lepton substructure searches **26,** 266
Quark model assignments 109
Quark model 109
Quark model, dynamical ingredients 112
Quark parton model 94
Quark searches, free **25,** 247
Quarks and leptons, weak interactions of 94, 102
Quarks, current masses of 102
Quarks, properties of 109
R function, e^+e^- scattering, plot of 119
$r(2510)$ [*now called* $f_6(2510)$] 317
Rad, unit of absorbed dose of radiation 73
Radiation, biological damage from chronic exposure 73
Radiation, Cerenkov 61
Radiation length of materials, table 54
Radiation length, relations for 66
Radiation, lethal dose from 73
Radiation, long-term risk 73
Radioactive sources, commonly used 73
Radioactivity and radiation protection 73
Radioactivity, natural annual background 73
Radioactivity, unit of absorbed dose 73
Radioactivity, unit of activity 73
Radioactivity, unit of exposure 73
Radon, component of natural annual background radioactivity .. 73
Range (mean) and energy loss in liquid hydrogen 69
Range (mean) and energy loss in Pb, Cu, Al, and C 68
Range, practical, for electrons 67
Range, scaling law for projectile mass and charge 69
Rao-Cramér-Frechet bound 77
Rapidity 92
Refractive index of materials, table 54
Relativistic kinematics 90
Relativistic transformation of electromagnetic fields 84
Rem, roentgen equivalent for man 73
Resistivity, relations for 85
Resistivity, Electrical, of elements, table 55
Resonance, Breit-Wigner form and Argand plot for 93
Resonances (see Meson resonances and Baryon resonances)
Restricted energy loss rate, charged projectiles 65
ρ parameter of electroweak interactions 103
$\rho(770)$ **28,** 269
$\rho(1450)$ 295
$\rho(1700)$ **31,** 305
$\rho(2150)$ 313
$\rho_3(1690)$ [*was* $g(1690)$] **31,** 301
$\rho_3(2250)$ [*was* $\rho(2250)$] 314
$\rho_5(2350)$ [*was* $\rho(2350)$] 316
Robustness of statistical estimator, definition 77
Roentgen, measure of x or γ radiation intensity 73
Running coupling constant in QCD 96
Rydberg energy, value of 51
$S=+1$ Baryons 417
$S(975)$ or S^* [*now called* $f_0(975)$] **29,** 277
$S(1730)$ [*now called* $f_0(1750)$] 308
$S(1935)$ [*now called* $X(1935)$] 310
S-matrix for two-body scattering 90
Scalar lepton searches **26,** 260
Scalar quark searches **26,** 261
SCALE factor, definition of 9
Scattering, deep inelastic 93, 97
Scattering, relations for 93
Scintillator parameters 61
Score function in likelihood fitting 79
Sea-level cosmic ray fluxes 61
Searches **25,** 140, 246
  Axion searches **25,** 251
  Centauro searches 266
  Chargino searches **26,** 260
  Compositeness, quark and lepton, searches **26,** 263
  Excited lepton searches **26,** 265
  Familion searches 254
  Fourth generation, top and, hadron searches **25,** 246
  Free quark searches **25,** 247
  Gluino searches **26,** 261
  Heavy boson searches 257
  Heavy lepton searches **25, 26,** 148
  Heavy particle searches 267
  Higgs searches **25,** 255
  Lepton, quark compositeness searches **26,** 263
  Lepton, quark substructure searches **26,** 263
  Leptoquark searches 259
  Light boson searches 251
  Light particle searches 266
  Magnetic monopole searches **25,** 249
  Majoron searches 254
  Massive neutrinos and lepton mixing, searches **25,** 140
  Neutrino bounds from astrophysics and cosmology 146
  Neutrino oscillation searches **25,** 140
  Neutrinoless double beta decay searches 144
  Neutralino searches **26,** 259
  Other stable particle searches 266
  Photino searches **26,** 259
  Quark searches, free **25,** 247

Greek letters are alphabetized by their English-language spelling. Bold page numbers signify entries in Particle Properties Summary Tables.
† Omitted from this edition; see listed page number in Phys. Lett. **111B** (1982).

Quark and lepton compositeness searches **26,** 263
Quark and lepton substructure searches **26,** 263
Scalar lepton searches **26,** 260
Scalar quark searches **26,** 261
Substructure, quark and lepton, searches **26,** 263
Supersymmetric partner searches **26,** 259
Tachyon searches 266
Technipion searches **25,** 257
Top and fourth generation hadron searches **25,** 246
Weak gauge boson searches **25,** 257
Selection and treatment of data in this Review 7
Shower detector energy resolution 62
Showers, electromagnetic, longitudinal distribution of 66
SI units, complete set 53
Sievert, unit of radiation dose equivalent 73
Σ resonances (see also Λ and Σ resonances) **42,** 443
Σ^+ **22, 24,** 233
Σ^0 ..... **22, 24,** 235
Σ^- **22, 24,** 235
$\Sigma^- \to \Lambda e^- \nu$, note on 237
$\Sigma_c(2455)$ **43,** 471
Silicon strip detectors 63
$\sin^2\theta_W$, weak mixing angle 102
Singlet-octet mixing in quark model 110
SLC (SLAC) accelerator parameters 59
S$p\overline{p}$S (CERN) accelerator parameters 60
Solar luminosity, value of 52
Solar ν experiments 142
Solar mass, value of 52
Solar radius, value of 52
Sources, radioactive, commonly used 73
Specific heats of elements, table 55
Spherical harmonics 86
SSC accelerator parameters 60
Stable particles, definition used in this Review 3
Standard Model of electroweak interactions 102
Standard particle numbering for Monte Carlos 113
Statistic, definition of 77
Statistical procedures used in this Review 7
Statistics 77
Stefan-Boltzmann constant, value of 51
Stopping power for heavy charged projectiles 64
Straight-line fit, relations for 78
Strange baryons **22, 41,** 229, 417
Strange mesons **16, 35,** 175, 345
Strangeness-changing neutral currents, tests for 45
Structure functions, electroproduction, relations for 94
Structure functions for νN, $\overline{\nu} N$, $\mu^\pm$, and $e^- N$, plots of 115, 116
Structure functions in quark parton model 94
Structure functions, leptoproduction, relations for 94
Student's t distribution, Monte Carlo algorithm for 83
Student's t distribution, relations for 76
SU(2)×U(1) 102
SU(3) classification of baryon resonances 111
SU(3) isoscalar factors 87
SU(3) representation matrices 87
SU(3) multiplets 110
SU(6) multiplets 111
SU(n) multiplets 88
Substructure, quark and lepton, searches **26,** 263
Substructure, quark and lepton, searches, note on 263
Subtraction schemes in QCD 96
Summary Tables, description of 3
Supersymmetric partner searches **26,** 259
Superweak model predictions for $|\eta_{00}/\eta_{+-}|$, ϕ_{+-}, and Re ϵ for K_L^0 196
Survival probability, relations for 90
Synchrotron radiation 85
Systematic errors, treament of, in this Review 8
T (time reversal), tests of conservation 45
T^0 [*now called* Ω_c^0 245
Tachyon searches 266
τ decay problem, note on 157
τ lepton **14, 24,** 157
Technipion searches **25,** 257
TEVATRON (Fermilab) accelerator parameters 60
Thermal conductivity of elements, table 55
Thermal expansion coefficients of elements, table 55
$\theta(1690)$ [*now called* $f_2(1720)$] **31,** 307
θ_W, weak mixing angle 102
Thomson cross section, value of 51
Three-body decay kinematics 90
Three-body phase space 91
Top and fourth generation hadron searches **25,** 246
Transformation of electromagnetic fields, relativistic 84
TRISTAN (KEK) accelerator parameters 59
Tropical year, length of 52
Truth -- see Top
Two-body decay kinematics 90
Two-body differential cross sections 92
Two-body partial decay rate 90
Two-body scattering kinematics 91
Two-photon processes in e^+e^- annihilation 95
Unified atomic mass unit, value of 51
Uniform probability density function 74
Units and conversions, selected 51
Units, electromagnetic 84
Units, SI, complete set 53
Universe, cosmological properties of 52
Universe, density parameter of 52
Universe, critical density of 52
Universe, age of 52
UNK (Serpukhov) accelerator parameters 60
Upper limits, Gaussian distribution 80
Upper limits, Poisson distribution 81
Υ states, width determinations of, note on 339
$\Upsilon(1S)$ or $\Upsilon(9460)$ **34,** 339
$\Upsilon(2S)$ or $\Upsilon(10023)$ **34,** 341
$\Upsilon(3S)$ or $\Upsilon(10355)$ **34,** 344
$\Upsilon(4S)$ or $\Upsilon(10580)$ **34,** 344
$\Upsilon(10860)$ **35,** 345
$\Upsilon(11020)$ **35,** 345
Variance, definition 74
Variance, relations for 74
Vector meson candidates 317
VEPP-4m (Novosibirsk) accelerator parameters 59
VLEPP, INP (Serpukhov) accelerator parameters 59
W gauge boson **13,** 134
W gauge boson mass, value of **13,** 51, 102
W gauge boson, discussion of mass, width, branching ratios, and coupling to fermions 102
Weak gauge boson searches **25,** 257
Weak interactions of quarks and leptons 102, 107
Weak mixing angle 102
Weak mixing angle, value of 51
Weighted averaging, relations for 77
Width determinations of Υ states, note on 339
Wien displacement law constant, value of 51

Greek letters are alphabetized by their English-language spelling. Bold page numbers signify entries in Particle Properties Summary Tables.
† Omitted from this edition; see listed page number in Phys. Lett. **111B** (1982).

$X(1700)$ [*was* $\eta(1700)$] 307
$X(1850)$ [*was* $\phi_J(1850)$] 310
$X(1900–3600)$ 320
$X(1935)$ [*was* $S(1935)$] 310
$X(2220)$ [*was* $\xi(2220)$] 314
Ξ resonances **43,** 463
Ξ^0 ..... **22, 24,** 238
Ξ^- **22, 24,** 239
Ξ_c^+ [*was* A^+] **23,** 245
$\xi(2220)$ [*now called* $X(2220)$] 314
Y^* resonances (see Λ and Σ resonances) **41,** 417
Young diagrams 88
Young's modulus of solid elements, table 55
Z gauge boson **13,** 135
Z gauge boson mass, value of **13,** 51, 102
Z gauge boson, discussion of mass, width, branching ratios, and coupling to fermions 102
Z^* resonances (KN system) 417

Greek letters are alphabetized by their English-language spelling. Bold page numbers signify entries in Particle Properties Summary Tables.
† Omitted from this edition; see listed page number in Phys. Lett. **111B** (1982).